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January 18, 2019

The Honorable Marlene H. Dortch
Secretary of the Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Dear Secretary Dortch:

SUBJECT: FCC Office of Engineering and Technology (OET) and Wireless Telecommunications Bureau (WTB) Request for Comment on 5GAA's Petition for Waiver to Allow Deployment of Cellular Vehicle-To-Everything (C-V2X) Technology In The 5.9 GHz band (DA/FCC No.: DA-18-1231); [GN Docket No.: 18-357]

The Utah Department of Transportation (UDOT) is pleased to provide comments on the Federal Communications Commission's (FCC's) Public Notice referenced above, dated December 6, 2018. With the Public Notice, the FCC's Office of Engineering and Technology (OET) and Wireless Telecommunications Bureau (WTB) invited comments on the Fifth Generation Automotive Association's (5GAA) petition for waiver to deploy Cellular Vehicle-to-Everything (C-V2X) technology in the 5,850–5,925 MHz frequency band (5.9 GHz band).

UDOT is committed to a transportation system that is safe, efficient, and serves the public need. One of our primary goals is safety and specifically reducing roadway fatalities, injuries, and crashes to zero. We fully support the premise that connected vehicle technology, coupled with advancements in vehicle automation, is the primary path to meeting that goal. For over ten years, UDOT has invested effort and resources to plan, develop, and deploy connected vehicle technology. Over the past four years, we have invested $1.5 million in the deployment of dedicated short range communication (DSRC) systems in the 5.9 GHz band, and have recently committed another $8 million in the first phase of a multi-year project to expand our connected vehicle infrastructure ecosystem. We currently have 72 intersections and 35 fleet vehicles with DSRC equipment installed and operating, and another 55 intersections and 47 vehicles slated for operation in the next 60 days. These are not pilot deployments, but are in a full operational environment. DSRC technology is developed, available, and in active use in our system. We believe that this available technology should continue to be deployed

now toward our goal of saving lives, and not be inhibited while we wait for the development of other technologies.

UDOT recognizes 5GAA's commitment to advancing C-V2X technology through the subject petition for waiver to operate in the 5.9 GHz band, and supports the incremental, appropriate development and testing of new technologies. However, the 5GAA proposal ignores important considerations about existing technologies, lacks critical details, is detrimental to the public interest, and fails to consider reasonable alternatives. In short, the proposal fails to meet the criteria needed to justify the waiver.

The waiver request proposes the FCC grant a blanket waiver to allow for deployment of C-V2X technology in the 5.905–5.925 GHz range of the 5.9 GHz band. This space is currently set aside for the operation of two DSRC Service Channels: 182 and 184, each 10 MHz wide. To grant a waiver, at least one of the following criteria must be decided: (i) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest; or (ii) in view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome, or contrary to the public interest, or the applicant has no reasonable alternative. The first criteria is not satisfied because i) the underlying purpose of the original rule is currently being met with existing technologies, and ii) impeding the existing deployment momentum would be detrimental to the public interest due to the delay in critical safety and efficiency benefits already being deployed and realized. The second criteria is not satisfied because i) making this change would create a burden on existing users, to the detriment of the public interest, and ii) C-V2X deployments are currently allowed under the FCC's experimental licensing system. The applicant has reasonable alternatives and has not addressed them in the waiver request. Further, granting 5GAA's blanket waiver would likely open the door for additional waivers to follow suit and frustrate and confuse the broad national efforts to deploy within the current rule. UDOT respectfully requests that the FCC withhold this waiver petition. We encourage the FCC to follow the formal rulemaking process if it seeks to change these rules, taking the issues raised in this waiver request in context with other current considerations, to consider the entire range of issues relative to this spectrum, and not to make sudden, detrimental decisions on a piecemeal basis.

Supporting detail for UDOT's request that this waiver be withheld is described more fully below.

Channel Usage

1. Based on the FCC's current band plan, Channel 182 is designated for low-power, short-range communications broadcasting safety, security, mobility and non-priority application messages, primarily from infrastructure-to-vehicles (I2V). Channel 184 is designated for "High Power Public Safety" use and intersection collision avoidance applications, broadcasting safety critical messages such as emergency vehicle signal preemption. In our four years of field testing and deployment, UDOT has used, and still uses, multiple channels within the 5.9 GHz band. With regards to the current petition, using channel 184 is a critical part of our deployments. Removing our access to this channel would impose significant negative impacts to our operations, progress, and budget.

2. The waiver request indicates that "*5GAA has crafted this Waiver Request to ensure that C-V2X deployment under the requested relief should have no significant impact on any existing DSRC operations in the band*" (pg.21) and "*Permitting C-V2X operations in the upper 20 MHz portion of the 5.9 GHz band, subject to the conditions detailed herein, would have substantial, long term benefits without causing a material impact on any current DSRC operations*" (pg.31). The operational UDOT deployments using DSRC technology described above are clear evidence that these statements about "no significant impact" are incorrect and incomplete. Channel 184 is a critical part of our deployments, and the impact that would be caused by requiring us to modify our systems and test and verify the use of other channels in our deployments is not insignificant.

3. The waiver request acknowledges that "*5GAA is aware of pilots involving DSRC Roadside Units which use all or a portion of the 5.905-5.925 frequencies for support"* and that *"5GAA will engage in discussions with the parties involved with these pilots to ensure that any operations using any portion of 5905-5925 MHz can either transition to lower DSRC channels or use C-V2X technology"* (footnote 74, pg. 28). UDOT's deployments are not experimental pilots, but are fully operational deployments providing measured and demonstrated value in our transportation network. Engaging in discussions about a currently unavailable and unproven alternative approach is a vague and unsuitable proposal for mitigation with an unreasonable timeline. As indicated above, reallocation of channels will result in serious operational impacts to our system. Any consideration of channel modifications needs a substantive transition plan with specific timelines.

4. UDOT is a leader in the national Signal Phase and Timing (SPaT) Challenge, an effort to deploy DSRC roadside units in every state in the country. We regularly interact with colleagues in other states and local jurisdictions who are deploying and operating DSRC systems. These deployments utilize multiple channels in the 5.9 GHz band, including Channels 182 and 184, a fact reinforced in the USDOT's recent "*Preparing for the Future of Transportation: Automated Vehicles 3.0* (AV 3.0)" guidance document[1]. Just as a limitation on Channel 184 will inhibit UDOT's substantial progress on connected vehicle deployment and impose additional costs, this limitation will negatively impact our colleagues around the country and the corresponding collaborative benefit we realize through sharing best practices with them. It will impede the progress of the SPaT Challenge. Any proposal to modify band allocation needs to include a specific plan for mitigating the impacts of current users.

5. A grant of this waiver request creates scenarios where DSRC and C-V2X would likely operate in adjacent channels [DSRC in Channels 172 thru 180, C-V2X in Channels 182 and 184]. 5GAA's request indicates that "*because C-V2X and DSRC operations will occur on different channels, each technology will be protected from interference from the other"* (pg. 28). This assertion is not supported. UDOT is aware of recent experiences by colleagues where FCC's decision to allow cellular communications belonging to Sprint-Nextel to operate in the 800 MHz Public-Safety spectrum resulted in harmful interference to safety critical communications. We are also aware of a scenario where secondary users in the 5.9 GHz band created significant interference with the operation of DSRC on at least one channel. Any consideration of allowing DSRC and C-V2X to co-exist in adjacent channels needs to be accompanied by detailed analysis and independent testing employing multiple devices in a field setting demonstrating that this scenario will not compromise the integrity of operation by each of these technologies, with proposals for interference mitigation (including a potential guard band).

6. 5GAA makes it clear that its request "*should not be misconstrued as an indication that C-V2X requires only 20 MHz of spectrum*" and subsequently, "*5GAA thus plans to file a complementary petition for rulemaking in the near future requesting that the Commission initiate a proceeding to modify its 5.9 GHz band ITS rules to provide stakeholders the flexibility to take the evolutionary leap forward in connected vehicle technologies enabled by 5G"*

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[1] Page 14 - https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf

(pg. 5). UDOT finds this statement inconsistent with other assertions that that "*5GAA has crafted this Waiver Request to ensure that C-V2X deployment under the requested relief should have no significant impact on any existing DSRC operations in the band*"(pg.21). While removing two channels from DSRC operations will cause significant harm and delay to many existing deployments, removing even more channels will potentially cripple DSRC operations entirely. As noted above, UDOT requests that the FCC withhold this waiver request and follow the formal rulemaking process if it seeks to change these rules taking into consideration the subsequent 5GAA request for even more bandwidth in light of the entire range of issues relative to this spectrum.

7. The 5.9 GHz band is currently the subject of comprehensive testing to evaluate the impacts of sharing with Unlicensed National Information Infrastructure (U-NII or Unlicensed) devices[2]. A grant of 5GAA's waiver request would likely invalidate the FCC's Phase I test results since C-V2X was not considered or tested in this scheme. Invalidating this testing will undermine the underlying purpose of the rule by delaying progress in understanding interference from unlicensed devices. Further, UDOT has grave concerns about a potential scenario wherein the band is open to allow simultaneous operation of DSRC, C-V2X, and U-NII devices which could compromise the integrity and utility of the band to safety and mobility applications. Any consideration of spectrum reallocation needs to consider all potential changes together, supported by independent and comprehensive testing on a large scale, the same testing standard that DSRC was subjected to in the USDOT Connected Vehicle Safety Pilot Program.

<u>Serving the Underlying Purpose of the Rule</u>

8. 5GAA makes numerous statements about the benefits of Intelligent Transportation System (ITS) technology in the 5.9 GHz band, and uses these benefits to argue that C-V2X be allowed to operate in this band in order for these benefits to be realized. However, they are silent on the fact that numerous DSRC deployments are already bringing many of these ITS benefits to the public in multiple locations. In fact, 5GAA failed to present evidence that C-V2X would provide any additional or unique benefits in the near term over what is possible with current DSRC technologies. As such, the waiver request undermines the underlying purpose of the existing rule by disrupting existing efforts to meet the rule's intent. Current DSRC deployments are using

[2] ET Docket No. 13-49

advanced electronics to bring about robust ITS services to Americans today, realizing the benefits that Congress, the DOT, and the FCC have envisioned for decades: improving traveler safety and mobility, decreasing traffic congestion, and facilitating cleaner air.

Public Interest

9. UDOT has a fiduciary responsibility to the taxpayers of Utah to ensure we follow a public process for planning and executing projects that efficiently and effectively utilize public funds to provide safe, sustainable transportation solutions. Considering our significant effort and expense to deploy DSRC-based equipment, and our current plans to greatly extend deployment, UDOT is concerned that our publicly-funded investment in this life-saving technology could be rendered obsolete due to an unanticipated change in rules surrounding the 5.9 GHz band. The rulemaking process is critical in our ability to know which technologies have been approved and adopted so that we can plan, program, and execute projects. To allow a change to a standing rule through a petition as opposed to a formal rulemaking process is disruptive, impedes our ability to provide sustainable transportation solutions, disrupts our planning for the lifecycle of technologies, wastes public funds, and is harmful to the public interest.

10. In 2018, researchers at the University of Michigan completed a study which quantified the costs of delaying deployment of safety-critical applications. Specifically, they evaluated the cumulative number of lives which will be lost if we wait even three or five years for a new technology (5G) to be developed and proven. They concluded that tens of thousands of lives can be saved by deploying DSRC now instead of waiting. While 5GAA asserts that C-V2X may be ready for use within the next year, the intense, iterative testing, standard development, and real-world piloting that will be necessary for this technology to be reliably introduced into our transportation systems for safety-critical use will take much longer. As an agency responsible to save lives, we believe it is harmful to the public interest to delay deployment of proven technologies by disrupting the known and currently applied spectrum allocation, while we wait for something better to come along. This is especially true when the cost is tens of thousands of human lives.

11. The waiver request highlights the performance benefits of C-V2X based on tests conducted at four (4) locations in the US: Fowlerville, MI, Denver, CO, San Diego, CA and Columbia, MD. Before an assertion of better performance is used to justify gaining spectrum, UDOT maintains that rigorous

independent field testing involving additional scenarios and multiple devices, as was demonstrated with DSRC devices in the USDOT Connected Vehicle Safety Pilot Program in Ann Arbor, Michigan, is in the public interest. As noted above, this testing should incorporate all elements of anticipated changes including C-V2X and unlicensed devices in order to be viable.

Reasonable Alternatives

12. As early prototypes of C-V2X equipment have been tested outside of the laboratory, interested parties have sought and obtained experimental licenses. The use of these licenses, together with local agreements defining the geographical region where the experimental deployment will occur, has been and is still an appropriate mechanism for testing this new technology. This approach is a reasonable alternative fully anticipated and made available by the FCC. The 5GAA has not made a case why these experimental licenses are an inadequate mechanism for continued development.

13. The 5GAA waiver request, in seeking to take spectrum from existing users, has made no attempt to identify other alternatives for available spectrum, such as the 6.0 GHz spectrum immediately adjacent to the spectrum that is the subject of the request or higher frequencies currently being anticipated for 5G use. Until reasonable alternative frequency options are identified and evaluated, it is inappropriate to consider reducing the spectrum that is currently being used for transportation safety and mobility.

UDOT is a member of the American Association of State Highway Transportation Officials (AASHTO), and is fully engaged in AASHTO's proactive efforts to advance and deploy V2X technology. In addition to the points raised in our response, UDOT supports the response filed by AASHTO relative to this waiver request filed on January 11, 2019.

UDOT maintains that DSRC is the only viable and mature technology available to support CV applications at this time. We recognize that future technologies may become available to support a CV environment that are similar or perhaps technically better than DSRC, and the industry must stay flexible to evaluate, consider, and adopt these technologies as appropriate, but submits that adoption must follow rigorous, independant testing, performance demonstrations, and the development of consensus standards. We must also consider the economic impacts, life cycle costs, and availability of the new technology for wide scale deployment. UDOT believes that the 5GAA waiver petition fails to address these key issues, undermines the underlying purpose of the existing rule, negatively impacts the public interest, and fails to consider reasonable alternatives.

Based on these issues, and considering the active current and planned DSRC-based equipment deployed on our transportation infrastructure, UDOT respectfully requests that the FCC withhold granting the waiver petition.

We appreciate the opportunity to provide these comments. If you would like to discuss the issues raised in this letter, please contact me, or Blaine Leonard, P.E., F.ASCE, UDOT's Transportation Technology Engineer at bleonard@utah.gov or (801) 887-3723.

Sincerely,

Carlos M. Braceras, P.E.
Executive Director

CMB/BL/dej

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